

I claim:

1. A method of cleaning a surface of an article having a metallic base body, the method which comprises:

generating a plasma with electrically positively charged ions, accelerating the ions towards the article, and bringing ions into contact with the base body for cleaning the base body;

directing an electron beam onto the base body; and

controlling an outgoing flow of electrons coming into contact with the base body by connecting the base body to a reference potential via a switch at a given frequency.

2. The method according to claim 1, which comprises selecting the given frequency from the group consisting of a fixed preset frequency, an adjustable frequency, and a regulated frequency.

3. The method according to claim 1, which comprises alternately opening and closing the switch to define an outgoing flux of electrons in an electric outgoing line connected to the base body.

4. The method according to claim 1, which comprises controlling an outgoing flux of electrons at a frequency in a range from a few Hz to a few MHz.

5. The method according to claim 1, which comprises controlling an outgoing flux of electrons at a frequency of substantially 50 kHz.

6. The method according to claim 1, which comprises controlling an outgoing flux of electrons at a frequency of substantially 27 MHz.

7. The method according to claim 1, which comprises controlling an outgoing flux of electrons such that a bias voltage of substantially between 100 V and 1000 V is established between the electrically positively charged plasma and the base body.

8. The method according to claim 1, which comprises determining a bias voltage between the electrically positively charged ions of the plasma and the base body.

9. The method according to claim 1, wherein the generating step comprises generating the plasma with the electron beam.

10. The method according to claim 1, which comprises forming the plasma with a gas selected from the group consisting of inert gas and reactive gas.
11. The method according to claim 1, which comprises forming the plasma with noble gas.
12. The method according to claim 1, which comprises forming the plasma with argon.
13. The method according to claim 10, which comprises forming the plasma with the reactive gas hydrogen.
14. The method according to claim 1, which comprises heating the article prior to cleaning.
15. The method according to claim 14, which comprises heating the article by irradiation with electrons.
16. The method according to claim 1, which comprises, concurrently with cleaning the article, heating the article to a coating temperature.
17. The method according to claim 16, which comprises heating the article to a coating temperature of over 800°C.

18. The method according to claim 1, which comprises providing a gas turbine component as the article and cleaning a surface of the gas turbine component.

19. The method according to claim 18, which comprises selecting the gas turbine component from the group consisting of a turbine blade and a heat shield element.

20. The method according to claim 1, which comprises rotating the article about an axis of rotation.

21. A method of coating an article, which comprises cleaning the article with the method according to claim 1, and subsequently coating the article with a protective layer with a physical vapor deposition process.

22. The method according to claim 21, which comprises, prior to the cleaning step, heating the article to a given temperature, and after the cleaning step and prior to the coating step, heating the article to a defined coating temperature.

23. The method according to claim 22, wherein the coating temperature lies above 800°C, and the given temperature lies above the coating temperature.

24. A device for cleaning an article, comprising:

a housing defining a substrate chamber;

a substrate guide disposed in said substrate chamber;

a substrate holder for holding an article connected to said substrate guide in a mechanically fixed and electrically insulated manner;

an electrical outgoing line connected to said substrate holder, and a switch connected in said electrical outgoing line for selectively connecting said substrate holder to a reference potential; and

an electron beam gun for generating an electron beam directed onto the article.

25. The device according to claim 24, wherein said substrate holder is configured to hold a component of a gas turbine.

26. The device according to claim 24, which further comprises a control device connected to said switch for controlling an alternating opening and closing of said switch.

27. The device according to claim 24, which further comprises a measuring device connected to said outgoing line for measuring one of a current and a voltage.

28. The device according to claim 27, which further comprises a control device connected to said switch for controlling an alternating opening and closing of said switch, and a measuring device connected to said outgoing line and to said control device for measuring one of a current and a voltage.

29. The device according to claim 24, which comprises a regulator connected to said switch, said regulator being preset to a desired value for regulating a switching frequency of said switch.